

# 5.1.D2 - LINEAR VS. EXPONENTIAL FUNCTIONS

Examine the output pattern to determine whether the situation can be represented by linear function or an exponential function. For the linear set, write a linear equation of the form  $y = mx + b$ ; for the exponential set, write an exponential equation of the form  $y = a(b)^x$ . (You will need to use the pattern to find the initial values.)

1.

x	1	2	3	4	5	6
y	1	4	7	10	13	16

2.

x	1	2	3	4
y	3	9	27	81

3.

x	1	2	3	4	5	6
y	2	4	8	16	32	64

4.

x	1	2	3	4
y	3	9	15	21

Can the situation be represented by a linear function or an exponential function?

- Sebastian deposits \$100,000 in a local bank that will pay out 5% interest every year.
- A certain type of corn grows at the rate of 3 inches per week.
- The Munn Sugar Processing Plant is able to process 10 tons of sugar per month.
- Exercise biologist, Samantha, discovered that to reduce soreness, people should start biceps curls at 10 pounds. Then, progress weekly to 15 pounds, 22.5 pounds, 33.75 pounds and so on.
- The amount of money in Suzie's piggy bank which she adds \$10 to each week.
- The amount of money a certificate of deposit that earns 4% interest each year.

Use the simple and compound interest formula to complete each table. Round to the nearest cent. Refer to the 5.1 example "Comparing Simple & Compound Interest" in the Chapter 5 Summary.

- Marty has \$8500 to deposit into an account. The interest rate available for the account is 2.4%.

TIME (YEARS)	SIMPLE INTEREST BALANCE	COMPOUND INTEREST BALANCE
EXPRESSION: $t$	EXPRESSION:	EXPRESSION:
1		
2		
4		
10		
12		

Solve the equation. Refer to the 2.2 example "Comparing Tables, Equations, and Graphs to Model and Solve Linear Situations" in the Chapter 2 Summary.

12.  $8x - 1 = 5x - 13$

13.  $3(6 - 2x) - 18 = -30$

Solve each system of equations using the linear combinations method. Write your solution as an ordered pair  $(x, y)$ . Refer to the 6.2 example "Solving a System of Equations Using the Linear Combinations Method" in the Chapter 6 Summary.

14.  $x - 2y = 11$   
 $2x + 5y = 4$

15.  $2x - 5y = 40$   
 $-4x + 3y = -10$

Determine whether the sequence is arithmetic or geometric. Write its explicit formula and use it to determine the 10<sup>th</sup> term. Write its recursive formula and use it to find the next 3 terms. Lastly, identify the sequence as a linear or exponential function. Refer to all Chapter 4 examples" in the Chapter 4 Summary.

	16) 625, 125, 25, ...	17) 4, -12, 36, ...	18) -13, -6, 1, ...
SEQUENCE TYPE			
EXPLICIT FORMULA			
10 <sup>TH</sup> TERM			
RECURSIVE FORMULA			
NEXT 3 TERMS			
LINEAR OR EXPONENTIAL			